The State of New Hampshire
DEPARTMENT OF ENVIRONMENTAL SERVICES

Thomas S. Burack, Commissioner

April 1, 2008

The Honorable Candice Bouchard, Chairman
House Public Works and Highways Committee
Legislative Office Building, Room 201
Concord, New Hampshire 03301

Re: Senate Bill 522 - relative to licensing requirements for small quantity biodiesel producers and distributors and prohibiting the sale or delivery of biodiesel not meeting the ASTM standard

Dear Chairman Bouchard and Members of the Committee:

The Department of Environmental Services (DES) is writing in support of Senate Bill 522 relative to the licensing requirements for biodiesel producers and distributors and to fuel quality requirements.

Biodiesel is a domestically produced, cleaner burning, renewable diesel fuel replacement derived from animal or vegetable oil. Biodiesel is not straight vegetable oil or animal fat, but rather is produced from these products through a chemical process called "transesterification" whereby the glycerin is separated from the oil. Biodiesel is most commonly mixed with petroleum diesel fuel in blends of 20% biodiesel to 80% petroleum diesel (referred to as B20) or lower, but can also be used in its neat form, B100, in warmer months, or at lower blends such as a 5%, or B5 blend. Biodiesel can be blended with either transportation diesel fuel or with heating oil and in this latter use the blend is termed "bioheat".

In the 2006 legislative session, House Bill 689 established the Biodiesel Study Commission. The Commission met numerous times between July and November 2007. A final commission report, issued in November 2007, outlined 16 specific recommendations to promote the production, distribution, and use of biodiesel in New Hampshire. The Executive Summary of that report and list of recommendations is attached to this letter. Implementation of two of the recommendations, to ensure biodiesel sold in New Hampshire meets stringent fuel quality standards (recommendation #3), and to make it easier for small producers and distributors to participate in the biodiesel market (recommendation #4), is the purpose of Senate Bill 522. Producers, distributors, and users of biodiesel throughout the state provided input to the Biodiesel Study Commission, helping the Commission to draft the two referenced recommendations, and helping to pass this legislation through the NH Senate.

To ensure environmental benefits are achieved from use of the fuel and to protect diesel engines and pumps, biodiesel must be produced to strict industry specifications established by ASTM International, the same organization that has established fuel quality

specifications for diesel fuel, heating oil, gasoline, and other petroleum fuels. Failure to meet the ASTM International fuel quality standards may result in fuel that has variable emissions characteristics or that may cause damage to diesel engines and equipment.

Passage of this bill would directly support two key initiatives of Governor Lynch. The 25 x '25 Initiative calls for 25% of New Hampshire's energy to come from renewable resources by 2025. Increased use of renewable biodiesel will be a key strategy in meeting this goal. The second initiative is the work being done by the recently established Climate Change Task Force which is charged with updating the State's Climate Change Action Plan and establishing targets for future reductions in greenhouse gas emissions. Again, low carbon renewable fuels such as biodiesel will play an important role in actions developed under this Plan.

To help achieve these renewable energy and climate change goals the state must support the creation of a local supply of, and in-state distribution infrastructure for, biodiesel by reducing the regulatory burden on small quantity producers and distributors. And in doing so, it is imperative that we continue to protect the public from negative health impacts from criteria pollutants and negative economic impacts that may be caused by low quality fuel. Senate Bill 522 accomplishes both of these tasks.

Thank you again for the opportunity to comment on Senate Bill 522. Please call Rebecca Ohler, Supervisor of the Mobile Source Section, at 271-6749, or me at 271-2958, if you have any questions or would like further information.

Sincerely,

Thomas S. Burack

Thomas S. Burack
Commissioner

cc: Senator Harold Janeway
Senator Jack Barnes
Rep. David Borden

Executive Summary

Biodiesel is a renewable, cleaner burning, domestically produced diesel fuel replacement. Biodiesel is often blended with petroleum diesel in various concentrations to fuel diesel vehicles and to warm homes and businesses in the winter as heating oil (bioheat). An example of a common blend is B20, a mixture of 20% biodiesel and 80% petroleum diesel.

Producing biodiesel is a fairly simple process and involves reacting vegetable oil or animal fat with an alcohol such as methanol or ethanol. The reaction produces biodiesel and the by-product glycerin for which there are various markets. A variety of oils and fats can be used in the process, including oil extracted from crops such as soybeans or sunflower seeds, fats derived from animal processing, and recycled restaurant oils and greases. Appendix A contains additional detail on the production of biodiesel.

In 2004, the citizens of New Hampshire spent over $710 million on diesel fuel and heating oil, with approximately $600 million of that leaving the state. Preliminary estimates show that nearly $60 million could have been retained in-state if the diesel fuel consumed had been B20 and the heating oil consumed had been B5, with all biodiesel production occurring and all of the associated feedstock grown in New Hampshire. Further analysis, which took into account the additive economic effects of this in-state production, indicated that up to 212 new jobs could be created, with a $210 million increase to the state's gross domestic product (GDP) and a $8.5 million increase in-state revenues[1].

At the present time, the production of biodiesel primarily relies upon vegetable oils derived from crops. It is important that any expanded use of cropland to support biodiesel feedstock production be done in a sustainable fashion that does not degrade the environment. In addition, policy makers need to be cognizant of the potential pressure that such feedstock production can have upon food supplies and prices.

There are many significant benefits associated with the use of biodiesel including:

- **Renewable energy utilization** (crops, waste grease and animal fats) that results in:
  - Less reliance on foreign oil
  - Greater fuel diversity, thereby improving supply and price stability of energy
  - Reduced greenhouse gas emissions
- **Economic opportunity** for New Hampshire farmers to grow production feedstocks and developers to manufacture the biodiesel in-state, thereby boosting the state's economy.

[1] One of the assumptions used to derive these economic benefits, that all feedstock would be produced in-state, is fairly speculative at this point as sufficient available farmland does not exist in the state to grow the necessary crops. However, research is ongoing into the technology of producing feedstock oil from algae, which is able to produce a far greater amount of oil in a given area than can crops. In addition, waste grease, tallow, and animal fats are also viable feedstock, though still limited in quantity.

- **Air emissions reductions** from diesel engines, furnaces and boilers. Use of biodiesel reduces emissions of hydrocarbons, carbon monoxide, carbon dioxide, sulfur compounds, and particulate matter, thereby benefiting public health and the environment.
- **Business cost avoidance** by extending diesel engine life and reducing maintenance due to the fuel's greater lubricity and cleaner burn.

Biodiesel shows great potential to improve the lives of New Hampshire's citizens. Examples of some of the various positive outcomes that could be expected from its adopted use include:

- A farmer cuts diesel fuel and heating oil costs by more than half by making biodiesel from crops grown on the farm and using it for farm operations.
- A school district drastically reduces the fine particulate emissions from its buses and furnaces, thereby protecting the health of all students, teachers, and staff.
- State government creates a healthier work environment, lowers maintenance costs, and increases the longevity of its diesel engines.
- A new home-grown, state-produced biodiesel industry develops which contributes significantly to the vitality of the state's economy.
- Landfills and municipal water systems experience reduced impacts from waste grease, with over 2.1 million gallons diverted from these facilities to biodiesel production facilities in the state.

All of these positive outcomes are possible by increasing production and use of biodiesel in New Hampshire. The Commission identified several barriers that currently inhibit the greater supply and use of biodiesel in New Hampshire. These include potentially higher cost, a lack of awareness regarding the benefits of using biodiesel and bioheat, inadequate local supply in areas where demand exists, an unfavorable regulatory environment for small distributors, lack of state or regional production facilities, and the need for additional research and investment in use of local crops, algae, and waste grease as biodiesel feedstock. The recommendations below are intended to address some of the barriers identified. The Commission further proposes to continue its work for another year.

Recommendations

1. **State Government Transportation Fuel.** The State of New Hampshire should lead by example by utilizing biodiesel blends in all state-owned diesel vehicles. To ensure wider use of biodiesel blends the New Hampshire Department of Transportation (NH DOT) should purchase only diesel fuel that contains at least 5% biodiesel (B5) for distribution at all state-owned fueling depots. This obligation should apply when biodiesel is available, and provided there is no additional financial burden to the state. Use of 20% biodiesel (B20) is recommended in areas where it is available and all vehicles refueling at a given NH DOT fueling depot are able to use the fuel (based on age of vehicles and engine compatibility). All biodiesel shall meet the fuel standard in recommendation #3 below. Legislation should be introduced during the 2008 session to implement this recommendation.

2. **State Government Heating Oil.** The State of New Hampshire should lead by example by utilizing a 5% bioheat fuel (B5) in all state owned buildings which currently use #2 heating oil. As biodiesel blends become available for #4 and #6 fuel oils, state buildings heated with such fuel types should also be required to use B5. This obligation should apply when bioheat is available, and provided there is no additional financial burden to the state. Bioheat should be defined by statute to refer to heating oil blended with biodiesel meeting the fuel standard specified in recommendation #3 below. Legislation should be introduced during the 2008 session to implement this recommendation.

3. **Fuel Standard.** Use of biodiesel as a motor vehicle fuel that does not meet ASTM International's D6751 standard is illegal under the provisions of the Clean Air Act Amendments of 1990. In addition, fuel not meeting this standard can cause damage to engines and other equipment in which it is used. Legislation should be introduced during the 2008 session requiring any biodiesel sold in New Hampshire meet ASTM D6751 (or any future standard that supersedes it), and granting the New Hampshire Department of Safety (NH DOS) authority to ensure compliance with the standard.

4. **Small Quantity Generators.** Licensing requirements for small quantity biodiesel producers and distributors should be eased by exempting them from having to obtain a surety bond. Legislation should be introduced during the 2008 session to implement this recommendation.

5. **State Taxation.** All motor vehicle fuel brought into or produced in-state is subject to the road toll (fuel tax) unless the fuel is colored with an identifying dye that marks it as fuel to be used for non-taxable purposes (e.g. heating oil, off-road equipment, marine fuel, etc.). The required concentration of the dye is established by federal law. New Hampshire law is set up to mirror federal law and currently requires that this dye be injected at a mechanized fuel distribution facility (known as "at the rack"). Smaller distributors and producers in the state who do not have this ability to dye at the rack have to pay the road toll on their product even if it is sold for a non-taxable purpose. This puts them at a competitive disadvantage. Federal law is being revised to allow for dying "below the rack" by manually adding dye to a fuel to reach the required dye concentration. NH DOS, who is responsible for the collection of the road toll, should adopt as soon as reasonably possible any federal tax provisions that allow for "below the rack" dying of biodiesel.

6. **Continuation of the Commission.** The Biodiesel Study Commission met seven times from July 31, 2007 through the end of October. In this short time the Commission was able to draft several concrete recommendations as proposed in this report. The Commission also recognized that increased use of renewable fuels such as biodiesel is critically important to the State's environment, public health, economic viability, and our energy security. Much work remains to be done to select proper measures that will effect lasting results. Legislation should be introduced in the 2008 session to continue the work of the Biodiesel Study Commission for an additional year with a final report to the Legislature by November 1, 2008. The legislation should add additional members to the commissions: two representatives from the petroleum distribution and marketing sector, one independent farm representative, one commercial biodiesel production representative, and one individual representing private investment interests.

7. **Children's Health.** Recognizing the increased vulnerability of children to health impacts from diesel exhaust, the Commission encourages school districts to use biodiesel for school buses and bioheat for school buildings that currently use #2 heating oil, and to enforce anti-idling policies on school grounds. The Department of Environmental Services (NH DES) should report on the use of biodiesel and bioheat by school districts to the House Science, Technology and Energy Committee and the Senate Energy, Environment and Economic Development Committee by September 1, 2009.

8. **Road Toll.** If the road toll is raised in a future legislative session, the increase should only be applied to that portion of a biodiesel blend that is petroleum diesel. Similar action by other states has had positive results in increasing use of alternative fuels. Some of the incentives offered by other states are shown in Appendix H.

9. **Federal Tax Credits.** Current federal tax credits, offered under the Energy Policy Act of 2005 in support of increased production and blending of biodiesel, expire in 2008. The tripling of biodiesel production and use from 2005 to 2006 nationally correlates to this federal tax incentive. The current New Hampshire Congressional delegation should be made aware of the importance of this tax credit to the growth of a biodiesel industry in New Hampshire and how an extension of the credit would benefit New Hampshire businesses. To implement this recommendation the Granite State Clean Cities Coalition (GSCCC), led by staff from NH DES, should ensure the delegation is informed of this issue and is invited to meetings of the GSCCC, at which this issue and the findings and recommendations of this Commission would be discussed.

10. **NH Feedstock Production.** Producing biodiesel using home-grown crops would provide some degree of energy independence and would direct dollars to struggling New Hampshire farmers rather than having them flow out of state for purchase of petroleum diesel and heating oil. Research should continue into identifying high yield strains of oilseed that can be grown in New Hampshire. Technical assistance should be provided to farmers by the University of New Hampshire Cooperative Extension in producing such crops. Funding should be sought to enable the Cooperative Extension to hire an agronomist and a specialist who could head up a sustainable agriculture and appropriate technology program as recommended in the September 2006 report from the Farm Viability Task Force (SCR 1 - 2005), *Cultivating Success on NH Farms: The New Hampshire Farm Viability Task Force Report*

11. **Local Farm Biodiesel Production.** Farms use large quantities of diesel to power their farm equipment and to heat their homes and other buildings. Current research has shown that oilseed can be grown and crushed on New Hampshire farms with the oil used to make the biodiesel onsite. The crushed meal becomes a nutritious feed for farm animals. It is recommended that the State support the pursuit of funds for ongoing farm-driven and university research on the economics of on-farm biodiesel production and methods of implementation.

12. **Biodiesel from Algae.** Microalgae may be a valuable source of biodiesel feedstock oil. The algae technology combines wastewater treatment, fuel production and production of nitrogen rich fertilizer. It is recommended that the State support the pursuit of funds by the UNH Biodiesel Group to continue and expand their algal feedstock research.

13. **Biodiesel from Waste Grease.** The burden of grease trap waste on municipal water supply providers and landfills in the region is increasing. ASMT D6751 certified biodiesel can be produced from both yellow and brown (grease trap) waste grease[2]. A concurrent and separate study commission that is specifically studying issues relative to brown grease (HB 1373, Chapter 261, Laws of 2006) has conservatively estimated the potential generation of 2.1 million gallons of brown grease in the state. Estimates for yellow grease are about the same, at 2 million gallons annually. The Commission recommends that the state support the diversion of yellow and brown grease waste from disposal facilities to fuel production facilities as production sites become available.

14. **Animal Waste Products as a Source of Biodiesel Feedstock.** Biodiesel can be produced from animal fat. The State of New Hampshire has only one slaughterhouse and no remaining rendering plants, although there is growing interest in locally raised meat. The Commission recommends that the Department of Agriculture, Markets, and Food review ways that regional slaughterhouses and rendering plants can be encouraged.

15. **Renewable Portfolio Standards (RPS).** In the 2007 legislative session, an RPS was established for the electricity sector. A side provision of the legislation required the Office of Energy and Planning to study the concept of applying an RPS requirement to thermal energy uses in the state. Bioheat would be a possible qualifying renewable. An avenue should be found for exploring the possibility of establishing a transportation RPS program where renewables such as biodiesel could be promoted in the transportation sector as well.

16. **Clean Cities Initiative.** Discussion and promotion of biodiesel usage should continue as part of the work done by GSCCC. The Commission requests that GSCCC make biodiesel discussion an agenda item in at least two of the next four quarterly stakeholder meetings and to invite to the meetings all members of this Commission, the House Science, Technology, and Energy Committee, the House Environment and Agriculture Committee, and the Senate Energy, Environment and Economic Development Committee. As time and resources allow, GSCCC is requested to help implement the recommendations of this Commission.

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[2] National Renewable Energy Laboratory, K.Shaine Tyson, Brown Grease Feedstocks for Biodiesel, June 19, 2002, http://www.nrbp.org/pdfs/pub32.pdf